SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate: N: 2757129	Ground Water: 0.0m	Borehole No: KCR/BH#14
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian	E: 42R308488	Geologist:: Yasir udding	Date Started: Apr-20-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +38.02	Driller: Allah Bux	Date Completed: Apr-24-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00																	
1.00	CRS-1	2.6		yellowish grey, dense to very dense, medium to coarse, Gravely SAND, trace silt (pieces of wood and solid waste)							0.00	1.00	98	NA	-	-	Dry Coring
	SPT-1				11	13	15	20	48								
2.00	CRS-2										1.00	2.00	98	NA	-	-	
	SPT-2				13	15	17	20	52								
3.00	CRS-3	7.4		Yellow, highly fracuted, very poor, closely jointed, medium hard to hard , limonitic Sandy LIMESTONE							2.00	3.00	95	Nil	-	-	
	SPT-3				20	50/6			R								
4.00	CRS-4										3.00	4.00	75	Nil	-	-	
5.00	CRS-5										4.00	5.00	75	11	4.10	4.21	Sample wax 11cm
6.00	CRS-6			Yellow, moderately fracuted, poor, closely jointed, meidum hard to hard, limonitic Sandy LIMESTONE							5.00	6.00	78	40	5.46	5.59	Sample wax 13cm
7.00	CRS-7			Yellow, highly fracuted, very poor, closely jointed, medium hard to hard , limonitic Sandy LIMESTONE							6.00	7.00	75	Nil	-	-	
8.00	CRS-8										7.00	8.00	52	Nil	-	-	
9.00	CRS-9										8.00	9.00	52	Nil	-	-	
10.00	CRS-10										9.00	10.00	60	Nil	-	-	

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2757129	Ground Water: 0.0m	Borehole No: KCR/BH#14
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R308488	Geologist:: Yasir udding	Date Started: Apr-20-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +38.02		Driller: Allah Bux	Date Completed: Apr-24-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10	20	30	40	50	CORE RUN Depth (m) From	To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	to	Remarks
10.00																					
11.00	CRS-11	1.7		Grey, highly fractured, very poor, weathered, medium hard, SHALE											10.00	11.00	80	22	10.33	10.55	Sample wax 22cm
12.00	CRS-12														11.00	12.00	75	Nil	-	-	
13.00	CRS-13	1.3		Brownsih yellow, highly fractured, very poor, closely jointed, medium hard, limonitic Sandy LIMESTONE											12.00	13.00	72	23	12.25	12.37	Sample wax 12cm
14.00	CRS-14	2.0		Brown, highly fractured, very poor, medium hard to hard, Sandy SHALE . (with lamination of Silt at a places)											13.00	14.00	70	Nil	-	-	
15.00	CRS-15														14.00	15.00	70	Nil	-	-	
				END OF BOREHOLE AT 15.0m Depth																	

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate: N: 2757989	Ground Water: 0.50m	Borehole No: KCR/BH#15
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian	E: 42R307969	Geologist: Efaz Danish	Date Started: Apr-23-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +35.40	Driller: Quaim	Date Completed: Apr-24-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00		1.0		Brown, Sandy/ Silty CLAY, little Gravel (Garbage material mixed with soil)													
1.00	CRS-1										0.00	1.00	90	NA	-	-	Dry Coring
	SPT-1	1.0		Brown, Soft, Sandy Silty CLAY, little Gravels	1	1	1	1	3								
2.00	CRS-2										1.00	2.00	95	NA	-	-	Dry Coring
	SPT-2	2.0		Brown, stiff to very stiff, Silty CLAY, trace Sand (traces of Garbage at 2.0m)	5	4	4	5	13								
3.00	CRS-3										2.00	3.00	98	NA	-	-	Dry Coring
	SPT-3				6	5	8	12	25								
4.00	CRS-4										3.00	4.00	97	NA	3.70	3.82	Sample wax 12cm
	SPT-4	2.9		Brown, hard, Silty CLAY/ Clayey SILT, with trace Sand	10	10	13	14	37								
5.00	CRS-5										4.00	5.00	100	NA	4.71	4.84	Sample wax 13cm
	SPT-5				11	12	14	18	44								
6.00	CRS-6										5.00	6.00	100	NA	5.87	6.0	Sample wax 13cm
	SPT-6				14	12	15	18	45								
7.00	CRS-7										6.00	7.00	100	26	-	-	
	SPT-7	3.1		Brown yellow, highly fractured, very poor, medium hard Sandy LIMESTONE	50/12cm				R								
8.00	CRS-8										7.00	8.00	70	Nil	-	-	
9.00	CRS-9										8.00	9.00	70	Nil	-	-	
10.00	CRS-10			(interbedded with fractured, medium hard, SHALE, between 9.0 to 10.0m)							9.00	10.00	86	33	9.5	9.62	Sample wax 12cm

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate: N: 2757989	Ground Water: 0.50m	Borehole No: KCR/BH#15
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian	E: 42R307969	Geologist: Efaz Danish	Date Started: Apr-23-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +35.40	Driller: Quaim	Date Completed: Apr-24-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10 20 30 40 50	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00																	
11.00	CRS-11	1.5		Yellowish brown, highly fractured to fractured, very poor, closely jointed, medium hard, Sandy LIMESTONE							10.00	11.00	71	Nil	-	-	
															11.37	11.50	Sample Wax 13cm
12.00	CRS-12	1.3		Grey, moderately fractured, good, moderately jointed, medium hard, SHALE							11.00	12.00	98	72	11.70	11.84	Sample Wax 14cm
13.00	CRS-13										12.00	13.00	75	24	-	-	
14.00	CRS-14	2.2		Grey, moderatly fractured, poor, moderately horizentally jointed, hard, fossiliferous LIMESTONE							13.00	14.00	80	42	13.80	13.93	Sample Wax 11cm
15.00	CRS-15										14.00	15.00	88	25	14.50	14.61	Sample wax 11cm
				END OF BOREHOLE AT 15.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756860	Ground Water: 1.35	Borehole No: KCR/BH#16
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R307419	Geologist: Yasiruddin	Date Started: Apr-25-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +32.75		Driller: Manzor	Date Completed: Apr-29-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00																	
1.00	CRS-1			Brown, loose to medium dense, fine to medium, Sandy SILT, some Clay and trace Gravels							0.00	1.00	98	NA	-	-	
	SPT-1	2.9			3	2	2	3	7								
2.00	CRS-2										1.00	2.00	98	NA	-	-	
	SPT-2				2	1	2	10	13								
3.00	CRS-3										2.00	3.00	80	NA	-	-	
	SPT-3	0.7		Brown, dense, Sandy SILT	11	12	13	14	39								
4.00	CRS-4			Brown, highly fractured, very poor, closely jointed, medium hard to hard, friable SANDSTONE, with lenses of SILTSTONE							3.00	4.00	88	Nil	-	-	
	SPT-4	1.4			50/10				R								
5.00	CRS-5										4.00	5.00	85	Nil	-	-	
6.00	CRS-6	2.3		Brown, highly fractured, very poor, closely jointed, medium hard, Silty SANDSTONE, interbeded with SHALE at places							5.00	6.00	35	12	5.88	6.00	Sample wax 12cm
7.00	CRS-7										6.00	7.00	40	Nil	-	-	
8.00	CRS-8	2.2		Brown, highly fractured, poor, closely jointed, meidum hard to hard, SHALE							7.00	8.00	80	27	7.50	7.65	Sample wax 15cm
9.00	CRS-9										8.00	9.00	90	20	8.18	8.38	Sample wax 20cm
10.00	CRS-10	0.5		Brown, highly fractured, very poor, medium hard to hard, friable SANDSTONE							9.00	10.00	85	Nil	-	-	

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756860	Ground Water: 1.35	Borehole No: KCR/BH#16
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R307419	Geologist: Yasiruddin	Date Started: Apr-25-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +32.75		Driller: Manzor	Date Completed: Apr-29-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10 20 30 40 50	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00				Brown, highly fractured, very poor, medium hard to hard, SHALE, interbeded with SILTSTONE													
11.00	CRS-11	3.0									10.00	11.00	75	Nil	-	-	
12.00	CRS-12										11.00	12.00	70	Nil	-	-	
13.00	CRS-13										12.00	13.00	70	Nil	-	-	
14.00	CRS-14	2.0		Brown, moderately fractured, poor, medium hard to hard, SHALE, interbeded with SILTSTONE							13.00	14.00	90	39	13.65	13.78	Sample wax 13cm
15.00	CRS-15										14.00	15.00	95	35	14.00	14.10	Sample wax 10cm
				END OF BOREHOLE AT 15.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756781	Ground Water: 1.25m	Borehole No: KCR/BH#17
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R307086	Geologist: Efaz Danish	Date Started: Apr-25-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +31.20		Driller: Qaim	Date Completed: Apr-27-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00																	
		1.6		Brownish grey, very loose, medium to coarse, Sandy Clayey SILT, some Gravel (Mixed with Garbage)													
1.00	CRS-1										0.00	1.00	98	NA			Dry Coring
	SPT-1				4	2	1	1	4								
		0.4		Grey brown, soft , Clayey SILT													
2.00	CRS-2										1.00	2.00	98	NA			Dry Coring
	SPT-2	0.7		Brown, medium dense, fine to medium, Clayey Silty SAND, little concretion	5	5	5	4	14								
3.00	CRS-3										2.00	3.00	80	NA	2.84	2.98	Sample wax 14cm
	SPT-3	1.0		Greyish brown, stiff to very stiff, Silty CLAY, trace concretion	5	5	6	8	19								
4.00	CRS-4										3.00	4.00	92	53	3.83	4.0	Sample wax 17cm
	SPT-4	1.3		Dark Brown, highly fractured, very poor, highly weathered, medium hard, SHALE	10	12	16	22	50								
5.00	CRS-5										4.00	5.00	97	14	-	-	
	SPT-5			Brown, fractured to highly fractured, fair, closely jointed, medium hard, CLAYSTONE, interbedded with SILTSTONE	30/5cm				R								
6.00	CRS-6	2.0									5.00	6.00	80	51	5.85	6.0	Sample wax 15cm
	SPT-6				51/15cm				R								
7.00	CRS-7										6.00	7.00	80	10	-	-	
	SPT-7			Yellowish brown, highly fractured, very poor, closely joints, slightly weathered, medium hard, Sandy LIMESTONE (joints filled with Clay)	30/2cm				R								
8.00	CRS-8										7.00	8.00	70	11	7.85	7.96	Sample wax 11cm
		3.0															
9.00	CRS-9										8.00	9.00	70	Nil	-	-	
10.00	CRS-10										9.00	10.00	70	Nil	-	-	

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756781	Ground Water: 1.25m	Borehole No: KCR/BH#17
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R307086	Geologist: Efaz Danish	Date Started: Apr-25-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +31.20		Driller: Qaim	Date Completed: Apr-27-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10 20 30 40 50	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00	SPT-10	0.5		Yellowish brown, highly fractured, very poor, closely jointed, medium hard to hard, Sandy LIMESTONE													
11.00	CRS-11	4.5		Brown, highly fractured, very poor, medium hard, Sandy SHALE							10.00	11.00	76	Nil	-	-	
12.00	CRS-12			Brown, slightly fractured, fair to excellent, moderately horizentaly jointed, medium hard, Sandy SHALE							11.00	12.00	75	52	11.70	11.88	Sample wax 18cm
13.00	CRS-13										12.00	13.00	100	83	12.63	12.77	Sample wax 14cm
14.00	CRS-14										13.00	14.00	100	93	13.69	13.78	Sample wax 9cm
15.00	CRS-15										14.00	15.00	98	76	14.78	14.94	Sample wax 16cm
				END OF BOREHOLE AT 15.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756716	Ground Water: 0.5m	Borehole No: KCR/BH#18
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R306839	Geologist: Efaz Danish	Date Started: Apr-27-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +29.32		Driller: Rauf	Date Completed: Apr-29-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00																
		1.0		Dark Brown, Silty SAND, little Clay and little Gravel, some Solid organic												
1.00	CRS-1									0.00	1.00	98	NA	-	-	Dry Coring
	SPT-1	1.0		Brown, Soft , Sandy SILT, some Gravels	2	1	1	2	4							
2.00	CRS-2									1.00	2.00	95	NA	1.83	1.96	Sample wax 13cm
	SPT-2	0.7		Brown, medium dense, medium to coarse, Silty SAND, some Gravels	10	11	6	4	21							
3.00	CRS-3									2.00	3.00	90	NA	-	-	
	SPT-3	1.3		Brown, Stiff, Silty CLAY, trace concretion	3	4	7	4	15							
4.00	CRS-4									3.00	4.00	77	NA	3.86	4.0	Sample wax 14cm
	SPT-4			Yellowish Brown, highly fractured, very poor, closely joints, medium hard, Sandy SHALE	13	23	54/8cm	-	R							
5.00	CRS-5									4.00	5.00	98	14	4.38	4.52	Sample wax 14cm
	SPT-5			Brown, Slightly to moderatly fractured, good, moderately jointed, medium hard, SHALE, lenses of SILTSTONE at places	12	12	20	47	79							
6.00	CRS-6									5.00	6.00	70	68	5.46	5.6	Sample wax 14cm
	SPT-6				36	15/1cm			R							
7.00	CRS-7	6.0								6.00	7.00	99	49	6.26	6.43	Sample wax 17cm
	SPT-7				55/5cm				R							
8.00	CRS-8									7.00	8.00	99	90	7.80	7.90	Sample wax 10cm
9.00	CRS-9									8.00	9.00	99	96	8.83	8.96	Sample wax 13cm
10.00	CRS-10									9.00	10.00	99	30	-	-	

Graph N/30 cm: 10 20 30 40 50

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate: N: 2756716	Ground Water: 0.5m	Borehole No: KCR/BH#18
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian	E: 42R306839	Geologist: Efaz Danish	Date Started: Apr-27-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +29.32	Driller: Rauf	Date Completed: Apr-29-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10 20 30 40 50	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00				Dark Brown, Slightly fractured, Excellent, slightly jointed, hard, SHALE													
11.00	CRS-11										10.00	11.00	99	84	10.43	10.60	Sample wax 17cm
12.00	CRS-12	4.6									11.00	12.00	99	96	11.00	11.14	Sample wax 14cm
				Brown, moderatly fractured, fair, moderately jointed, medium hard, SHALE,													
13.00	CRS-13										12.00	13.00	94	45	-	-	
				Brown, highly fractured, poor, closely jointed, medium hard, Sandy SHALE													
14.00	CRS-14										13.00	14.00	98	25	13.59	13.72	Sample wax 13cm
15.00	CRS-15	0.4		Brown, highly fractured, poor, closely jointed, fine grained, friable SANDSTONE							14.00	15.00	80	27	-	-	
				END OF BOREHOLE AT 15.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate: N: 2756472	Ground Water: 0.55m	Borehole No: KCR/BH#19
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian	E: 42R306386	Geologist: Wajid	Date Started: Apr-30-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +27.48	Driller: Qaim	Date Completed: May-1-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00																
1.00	CRS-1			Brown, stiff to very stiff, Silty CLAY, little SAND and Some Gravels in top 0.6m						0.00	1.00	99	NA	-	-	Dry Coring
	SPT-1	3.0			4	4	4	5	13							
2.00	CRS-2									1.00	2.00	98	NA	-	-	Dry Coring
	SPT-2				3	4	5	9	18							
3.00	CRS-3									2.00	3.00	99	NA	-	-	Dry Coring
	SPT-3	1.0		Brown, hard, Silty CLAY	13	13	15	14	42							
4.00	CRS-4									3.00	4.00	99	NA	3.86	4.0	Sample wax 14cm
	SPT-4	1.0		Brown, moderatly fractured, poor, moderately fractured, medium hard, SHALE	12	10	19	20	49							
5.00	CRS-5									4.00	5.00	99	35	-	-	
	SPT-5			Brown/ greyish brown, fractured to highly fractured, poor, medium hard, SANDSTONE, interbedded with SHALE	50/10cm											
6.00	CRS-6									5.00	6.00	70	36	5.72	5.83	Sample wax 11cm
7.00	CRS-7									6.00	7.00	80	17	-	-	
8.00	CRS-8	5.0								7.00	8.00	80	Nil	-	-	
9.00	CRS-9									8.00	9.00	81	Nil	-	-	
10.00	CRS-10			Greyish, brown,highly fractured, poor, medium hard, closely jointed SANDSTONE						9.00	10.00	82	11	9.67	9.78	Sample wax 11cm

Graph N/30 cm: 10 20 30 40 50

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756472	Ground Water: 0.55m	Borehole No: KCR/BH#19
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R306386	Geologist: Wajid	Date Started: Apr-30-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +27.48		Driller: Qaim	Date Completed: May-1-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10	20	30	40	50	CORE RUN Depth (m) From	To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	to	Remarks
10.00		5.0		Greyish brown/ brown, fractured to highly fractured, fair, closely jointed, medium hard, SANDSTONE																	
11.00	CRS-11														10.00	11.00	88	38	10.10	10.20	Sample wax 10cm
12.00	CRS-12														11.00	12.00	99	18	11.09	11.27	Sample wax 18cm
13.00	CRS-13														12.00	13.00	99	30	12.13	12.25	Sample wax 12cm
14.00	CRS-14			Greyish brown, slightly fractured, good to excellent, slightly fragmentated, sparely jointed, medium hard, SANDSTONE											13.00	14.00	92	52	13.15	13.27	Sample wax 12cm
15.00	CRS-15														14.00	15.00	99	75	14.42	14.54	Sample wax 14cm
				END OF BOREHOLE AT 15.0m Depth																	

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756197	Ground Water: 2.20m	Borehole No: KCR/BH# 20
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R305926	Geologist: Efaz Danish	Date Started: May-01-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +26.14		Driller: Manzoor	Date Completed: May-06-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00																
		1.5		yellowish Brown, medium dense, Sandy SILT, some Gravels												
1.00	CRS-1									0.00	1.00	98	NA	-	-	
	SPT-1				3	4	6	8	18							
2.00	CRS-2			Brown, dense, Sandy GRAVELS, little Clay.						1.00	2.00	75	NA	-	-	
	SPT-2	1.7			8	10	12	15	37							
3.00	CRS-3									2.00	3.00	79	NA	-	-	
	SPT-3				38	20/4cm			R							
4.00	CRS-4			Brown, highly fractured, very poor, closely jointed, friable SANDSTONE, little SILT						3.00	4.00	80	Nil	-	-	
	SPT-4	1.8			30	31	15/2cm		R							
5.00	CRS-5									4.00	5.00	79	Nil	-	-	
6.00	CRS-6			Brown, highly fractured, very poor, closely jointed, medium hard, SANDSTONE, lenses of SHALE						5.00	6.00	75	Nil	-	-	
7.00	CRS-7	3.3								6.00	7.00	70	Nil	-	-	
8.00	CRS-8									7.00	8.00	70	Nil	-	-	
9.00	CRS-9	0.7		Brown, , highly fractured, very poor, medium hard, Sandy SHALE						8.00	9.00	90	Nil	-	-	
10.00	CRS-10	1.0		Brown, highly fractured, very poor, friable Silty SANDSTONE, with lenses of Limestone						9.00	10.00	60	Nil	-	-	

Graph N/30 cm (10, 20, 30, 40, 50)

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756197	Ground Water: 2.20m	Borehole No: KCR/BH# 20
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R305926	Geologist: Efaz Danish	Date Started: May-01-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +26.14		Driller: Manzoor	Date Completed: May-06-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10	20	30	40	50	CORE RUN Depth (m) From	To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	to	Remarks
10.00				Brown, highly fractured, very poor, closely jointed, friable SANDSTONE																	
11.00	CRS-11	3.0													10.00	11.00	70	Nil	-	-	
12.00	CRS-12														11.00	12.00	70	Nil	-	-	
13.00	CRS-13														12.00	13.00	70	Nil	-	-	
14.00	CRS-14	1.0		Brown, highly fractured,very poor, moderatly weathered, SANDSTONE, interbeded with hard SHALE											13.00	14.00	70	Nil	-	-	
15.00	CRS-15	1.0		Brown, highly fractured, very poor, moderately weathered, diagonally and verticaly jointed, Sandy LIMSTONE, with lense of SHALE											14.00	15.00	70	Nil	-	-	
				END OF BOREHOLE AT 15.0m Depth																	

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2755827	Ground Water: 7.50m	Borehole No: KCR/BH#21
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R305113	Geologist: Wajid	Date Started: May-2-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +24.07		Driller: Qaim	Date Completed: May-5-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00				Brown, medium dense, fine to coarse, Sandy GRAVELS, some SILT as filled mateiral												
1.00	CRS-1	2.0								0.00	1.00	99	NA	-	-	Dry Coring
	SPT-1				5	4	3	5	12							
2.00	CRS-2									1.00	2.00	99	NA	-	-	Dry Coring
	SPT-2	1.0		Yellowish Brown, loose, Sandy SILT	2	2	2	3	7							
3.00	CRS-3									2.00	3.00	97	NA	-	-	Dry Coring
	SPT-3	1.0		yellowish brown, medium dense, medium to coarse, Silty SAND, some GRAVELS	3	3	5	5	13							
4.00	CRS-4									3.00	4.00	98	NA	-	-	
	SPT-4	2.0		Yellowish Brown, medium dense, Sandy SILT	3	2	4	5	11							
5.00	CRS-5									4.00	5.00	90	NA	-	-	
6.00	CRS-6									5.00	6.00	98	NA	-	-	
	SPT-5	1.0		Brown, dense, fine to coarse, Gravely Silty SAND	32	14	24	10	48							
7.00	CRS-7									6.00	7.00	98	NA	-	-	
	SPT-6	3.0		Yellowish Brown, highly fracture, very poor, medium hard, Sandy SHALE, with lenses of SANDSTONE	50/10cm				R							
8.00	CRS-8									7.00	8.00	92	Nil	-	-	
9.00	CRS-9									8.00	9.00	95	13	-	-	
	SPT-7															
10.00	CRS-10									9.00	10.00	90	23	9.64	9.84	Sample wax 20cm

Graph N/30 cm: 10 20 30 40 50

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2755827	Ground Water: 7.50m	Borehole No: KCR/BH#21
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R305113	Geologist: Wajid	Date Started: May-2-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +24.07		Driller: Qaim	Date Completed: May-5-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10 20 30 40 50	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00																	
		1.0		Yellowish brown, slightly fractured, good, medium hard, SILTSTONE													
11.00	CRS-11										10.00	11.00	97	65	10.00	10.15	Sample wax 15 cm
				Yellowish brown, highly fractured, very poor, medium hard, SANDSTONE													
12.00	CRS-12	2.0									11.00	12.00	98	16	-	-	
13.00	CRS-13										12.00	13.00	97	Nil	-	-	
		1.0		Brown, highly fractured, very poor, friable SANDSTONE													
14.00	CRS-14										13.00	14.00	98	Nil	-	-	
		1.0		Brown, highly fractured, very poor, friable SANDSTONE, intermix with Clay													
15.00	CRS-15										14.00	15.00	95	Nil	-	-	
				END OF BOREHOLE AT 15.0m Depth													

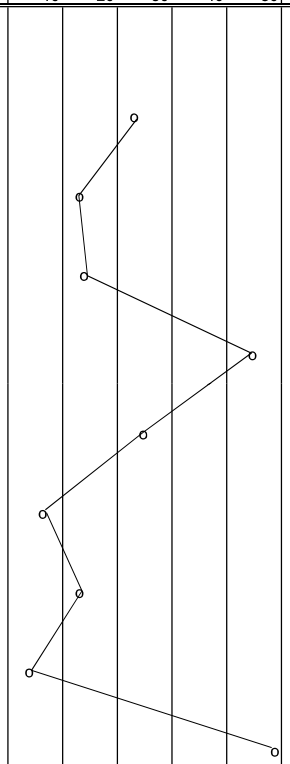
SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756074	Ground Water: 7.00m	Borehole No: KCR/BH#22
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R2304536	Geologist: M.Noman	Date Started: May-4-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +15.60		Driller: Manzoor	Date Completed: May-8-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00 – 1.00	CRS-1	1.0		Brown, fine to coarse, SAND, with some Gravels, trace Silt & Clay & Solid waste						0.00	1.00	90	NA	-	-	Dry Coring
1.00 – 2.00	SPT-1 / CRS-2	3.0		Greyish, brown, medium dense, Sandy Gravel, trace to little SILT, trace organic material & solid waste	15	7	4	12	23	1.00	2.00	80	NA	-	-	Dry Coring
2.00 – 3.00	SPT-2 / CRS-3				19	6	5	2	13	2.00	3.00	77	NA	-	-	
3.00 – 4.00	SPT-3 / CRS-4				3	2	4	8	14	3.00	4.00	72	NA	-	-	
4.00 – 5.00	SPT-4 / CRS-5	2.0		Yellowish brown, dense to medium dense, Sandy GRAVEL, trace Silt	25	25	11	9	45	4.00	5.00	70	NA	-	-	
5.00 – 6.00	SPT-5 / CRS-6				15	7	5	13	25	5.00	6.00	50	NA	-	-	
6.00 – 7.00	SPT-6 / CRS-7	3.0		Grey, brown, loose to medium dense, fine to coarse, Gravely SAND, some SILT, with organic material	8	4	2	1	7	6.00	7.00	35	NA	-	-	
7.00 – 8.00	SPT-7 / CRS-8				2	2	1	10	13	7.00	8.00	35	NA	-	-	
8.00 – 9.00	SPT-8 / CRS-9				2	1	1	2	4	8.00	9.00	30	NA	-	-	
9.00 – 10.00	SPT-9 / CRS-10	1.0		Yellowish brown, very dense, Sandy GRAVEL, trace SILT, with organic material	32	50/5cm			R	9.00	10.00	70	NA	-	-	

Graph N/30 cm



SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756074	Ground Water: 7.00m	Borehole No: KCR/BH#22
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R2304536	Geologist: M.Noman	Date Started: May-4-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +15.60		Driller: Manzoor	Date Completed: May-8-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10 20 30 40 50	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00	CPT-1	1.0		Brown, very, dense, GRAVELS/ BOULDERS, traces of Silty CLAY	50/4cm				R	o							
11.00	CRS-11										10.00	11.00	80	NA	-	-	
12.00	CRS-12	4.0		Brown, highly fractured, poor, moderately weathered, Sandy SHALE, interlayered with highly fractured, medium hard, SILTSTONE							11.00	12.00	79	Nil	-	-	
13.00	CRS-13										12.00	13.00	80	Nil	-	-	
14.00	CRS-14										13.00	14.00	80	29	13.70	13.87	Sample Waxed 17cm
15.00	CRS-15										14.00	15.00	77	21	-	-	
				END OF BOREHOLE AT 15.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756087	Ground Water: 11.0m	Borehole No: KCR/BH#23
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R304454	Geologist: Noman	Date Started: May-7-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +19.33		Driller: Manzoor	Date Completed: May-10-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00				Brown, medium dense, coarse, Gravely SAND/ Sandy GRAVELS, trace to little Silt.													
1.00	CRS-1										0.00	1.00	80	NA	-	-	
	SPT-1	3.0			9	10	8	5	23								
2.00	CRS-2										1.00	2.00	70	NA	-	-	
	SPT-2				4	5	3	2	10								
3.00	CRS-3										2.00	3.00	60	NA	-	-	
	SPT-3	1.0		Brown, very dense, coarse, Gravely SAND, little Silt. (slightly cemented at places)	14	14	17	21	52								
4.00	CRS-4										3.00	4.00	70	NA	-	-	
	SPT-4			Brown, dense to very dense, Clayey Silty SAND, trace to little Gravels	9	18	16	13	47								
5.00	CRS-5										4.00	5.00	75	NA	-	-	
	SPT-5	3.0			17	18	15	15	48								
6.00	CRS-6										5.00	6.00	72	NA	-	-	
	SPT-6				14	14	16	22	52								
7.00	CRS-7										6.00	7.00	78	NA	-	-	
	SPT-7			Brown, very dense, coasre, SAND, trace to little Silt little Gravels	53/10cm				R								
8.00	CRS-8										7.00	8.00	60	NA	-	-	
	SPT-8	3.0			50/5cm				R								
9.00	CRS-9										8.00	9.00	50	NA	-	-	
	SPT-9				30	50/4cm			R								
10.00	CRS-10										9.00	10.00	50	NA	-	-	

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756087	Ground Water: 11.0m	Borehole No: KCR/BH#23
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R304454	Geologist: Noman	Date Started: May-7-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +19.33		Driller: Manzoor	Date Completed: May-10-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00	SPT-10	1.0		Brown, very dense, Sandy GRAVELS, trace Silt	25	27	50/6cm		R								
11.00	CRS-11										10.00	11.00	65	NA	-	-	
	SPT-11	3.7		Brown, highly fractured, very poor, highly weathered, loosely cemented, mediun hard, CONGLOMERATE	11	35	50/8cm		R								
12.00	CRS-12										11.00	12.00	67	Nil	-	-	
	CPT-1				50/15cm				R								
13.00	CRS-13										12.00	13.00	60	Nil	-	-	
14.00	CRS-14										13.00	14.00	65	Nil	-	-	
15.00	CRS-15	0.3		Brown, highly fractured, very poor, SANDSTONE							14.00	15.00	76	Nil	-	-	
				END OF BOREHOLE AT 15.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756248	Ground Water: 17.25m	Borehole No: KCR/BH#24
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R304322	Geologist: Wajid	Date Started: May-06-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +22.01		Driller: Quim	Date Completed: May-08-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00																	
		1.5		Yellowsih Brown, very dense, fine to coarse, Silty SAND pieces of concrete block, trace to little Gravels (as filled material)													
1.00	CRS-1										0.00	1.00	99	NA	-	-	Dry Coring
	SPT-1				35/5cm				R								
2.00	CRS-2			Dark Brown, very Stiff, Silty CLAY, some Sand							1.00	2.00	90	NA	1.85	2.00	Dry Coring
	SPT-2	1.5			5	8	8	8	24								
3.00	CRS-3										2.00	3.00	85	NA	-	-	Dry Coring
	SPT-3			Brown, dense, fine to coarse, Clayey SAND, little Gravels	11	12	12	12	36								
4.00	CRS-4	2.0									3.00	4.00	70	NA	-	-	Dry Coring
	SPT-4				30	20	20	20	60								
5.00	CRS-5										4.00	5.00	75	NA	-	-	Dry Coring
	SPT-5			Brown, very dense, fine to coarse, SAND, trace to little Silt, little Clay, and trace to some Gravels	30	35	40	30/05	R								
6.00	CRS-6										5.00	6.00	80	NA	-	-	Dry Coring
	SPT-6				24	20	20	51	91								
7.00	CRS-7	4.0									6.00	7.00	80	NA	-	-	Dry Coring
	SPT-7				50/10cm				R								
8.00	CRS-8										7.00	8.00	75	NA	-	-	Dry Coring
	SPT-8				50/10cm				R								
9.00	CRS-9										8.00	9.00	85	NA	-	-	Dry Coring
		1.0		Brown, very dense, Gravely Clayey SAND													
10.00	CRS-10										9.00	10.00	70	NA	-	-	Dry Coring

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756248	Ground Water: 17.25m	Borehole No: KCR/BH#24
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R304322	Geologist: Wajid	Date Started: May-06-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +22.01		Driller: Quim	Date Completed: May-08-2012

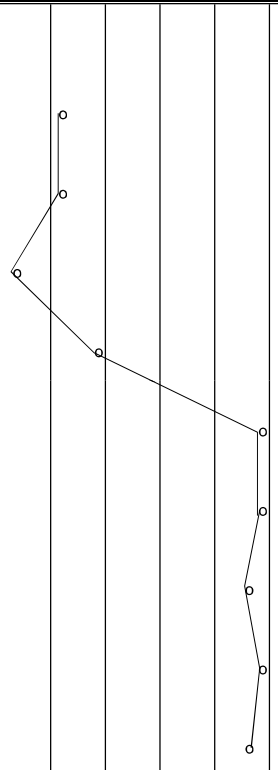
Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm 10 20 30 40 50	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00		1.0		Yellowish brown, very dense, fine to coarse, Silty SAND, trace to little Clay.													
11.00	CRS-11										10.00	11.00	70	NA	-	-	
		4.0		Yellowish grey, very dense, Clayey Sandy GRAVELS													
12.00	CRS-12										11.00	12.00	85	NA	-	-	
13.00	CRS-13										12.00	13.00	70	NA	-	-	
14.00	CRS-14										13.00	14.00	70	NA	-	-	
15.00	CRS-15										14.00	15.00	76	NA	-	-	
		1.0		Yellowish grey, highly fractured, poor, medium hard, SANDSTONE, interlayered with SHALE													
16.00	CRS-16										15.00	16.00	80	24	-	-	
		0.7		Greyish brown, highly fractured, loosly cemented, medium to coarse grained , medium hard, SANDSTONE													
17.00	CRS-17										16.00	17.00	65	Nil	-	-	
		2.3		Yellowish grey, slightly fratcured, excelent, medium hard, Sandy SHALE, with lenses of SILTSTONE and CONGLOMERATE													
18.00	CRS-18										17.00	18.00	85	82	17.33	17.46	Sample Waxed 13cm
19.00	CRS-19										18.00	19.00	90	63	18.85	19.99	
		1.0		Grey, highly fractured, very poor, loosely cemented, CONGLOMERATE, interlayered with Sandy SHALE													
20.00	CRS-20										19.00	20.00	75	Nil	-	-	
				END OF BOREHOLE AT 20.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756531	Ground Water: 12.80m	Borehole No: KCR/BH#25
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R303925	Geologist: Wajid	Date Started: May-9-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +20.41		Driller: Rauf	Date Completed: May-12-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	CORE RUN Depth (m) From	Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00				Greyish brown, medium dense, fine to coarse, Silty SAND, trace Gravels & organic impurities and garbages, (solid waste)												
1.00	CRS-1									0.00	1.00	90	NA	-	-	Dry Coring
	SPT-1	2.5			5	3	4	5	12							
2.00	CRS-2									1.00	2.00	80	NA	-	-	Dry Coring
	SPT-2				7	4	4	4	12							
3.00	CRS-3			Brown, loose, fine to coarse, Clayey SAND, little Gravels						2.00	3.00	75	NA	-	-	Dry Coring
	SPT-3	1.5			2	1	1	2	4							
4.00	CRS-4									3.00	4.00	80	NA	-	-	
	SPT-4	1.0		Brown, medium dense, Gravely SAND, some Clay, little concretion	4	4	8	8	20							
5.00	CRS-5									4.00	5.00	75	NA	-	-	
	SPT-5	1.0		Brown, very dense, fine to coarse, Silty SAND, little gravels	50/5cm				R							
6.00	CRS-6									5.00	6.00	77	NA	-	-	
	SPT-6	1.0		Brown, very hard, Sandy CLAY, little concretion	35/5cm				R							
7.00	CRS-7									6.00	7.00	76	NA	-	-	
	SPT-7	2.0		Brown, hard to very hard, Silty CLAY, some SAND	16	12	15	20	47							
8.00	CRS-8									7.00	8.00	80	NA	7.84	8.0	Sample Waxed 16cm
	SPT-8				15	15	25	25	65							
9.00	CRS-9									8.00	9.00	79	NA	-	-	
	SPT-9	1.0		Brown, very stiff, Clayey Silty SAND, trace Gravels	17	15	18	12	45							
10.00	CRS-10									9.00	10.00	80	NA	9.37	9.5	Sample Waxed 13cm



SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756531	Ground Water: 12.80m	Borehole No: KCR/BH#25
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R303925	Geologist: Wajid	Date Started: May-9-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +20.41		Driller: Rauf	Date Completed: May-12-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00	SPT-10	5.0		Brown, very dense, medium to coarse, Clayey Silty SAND, little Gravels	30/3cm				R								
11.00	CRS-11										10.00	11.00	79	NA	-	-	
	SPT-11				13	10	17	25	52								
12.00	CRS-12										11.00	12.00	80	NA	-	-	
	CPT-1				50/15cm				R								
13.00	CRS-13										12.00	13.00	77	NA	-	-	
	CPT-2				50/10cm				R								
14.00	CRS-14										13.00	14.00	80	NA	-	-	
	SPT-12				35/5cm				R								
15.00	CRS-15										14.00	15.00	81	NA	-	-	
16.00	CRS-16	1.8		Brown, highly fractured, very poor, fine to coarse grained, CONGLOMEARTE, with lenses of SHALE							15.00	16.00	75	19	-	-	
	CPT-3				35/10				R								
17.00	CRS-17										16.00	17.00	77	Nil	-	-	
	SPT-13	1.2		Yellowish brown, modertally fractured, fair, medium hard, Sandy SHALE	15/3				R								
18.00	CRS-18										17.00	18.00	70	60	-	-	
	SPT-14	2.0		Greyish black, highly fractured, very poor, loosely cemented, weak, CONGLOMERATE	30/5cm				R								
19.00	CRS-19										18.00	19.00	67	Nil	-	-	
	CPT-4				50/5cm				R								
20.00	CRS-20										19.00	20.00	65	Nil	-	-	
				END OF BOREHOLE AT 20.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756827	Ground Water: 8.10m	Borehole No: KCR/BH#26
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R303465	Geologist: Efaz Danish	Date Started: May-05-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: 20.40		Driller: Quaim	Date Completed: May-14-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	CORE RUN Depth (m) From	Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00		0.4		Pavement (10cm Asphalt with 30 cm rock filling)												
1.00	CRS-1	0.6		Brown, Sandy SILT, trace Gravels						0.00	1.00	90	NA	-	-	Dry Coring
	SPT-1	0.5		Brown, dense, fine to medium, Clayey SAND	7	10	12	18	40							
2.00	CRS-2	2.5		Brown, medium dense to very dense, medium to coarse, Gravely SAND, little SILT						1.00	2.00	80	NA	-	-	Dry Coring
	SPT-2				2	2	8	8	18							
3.00	CRS-3									2.00	3.00	45	NA	-	-	Dry Coring
	SPT-3				10	30/50cm			R							
4.00	CRS-4									3.00	4.00	60	NA	-	-	
	SPT-4	1.0		Brown, very dense, medium to coarse, Gravely Silty SAND.	30/10cm				R							
5.00	CRS-5									4.00	5.00	65	NA	-	-	
	SPT-5	0.8		Brown, very hard, Sandy CLAY, little Gravels.	18	20	26	37	83							
6.00	CRS-6	2.2		Reddish Brown to brown, very hard, fine to medium, Sandy CLAY						5.00	6.00	60	NA			
	SPT-6				20	20	20	30	70							
7.00	CRS-7									6.00	7.00	79	NA	6.56	6.7	Sample wax 14cm
	SPT-7				20	30	35	-	R							
8.00	CRS-8									7.00	8.00	75	NA	-	-	
	SPT-8	1.0		Brown, very hard, Silty CLAY	20/2cm				R							
9.00	CRS-9									8.00	9.00	75	NA	8.50	8.67	Sample wax 17cm
10.00	CRS-10	1.0		Brown, highly fractured, very poor, loosely cemented, weak, CONGLOMERATE						9.00	10.00	65	Nil	-	-	

Graph N/30 cm (10, 20, 30, 40, 50)

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2756827	Ground Water: 8.10m	Borehole No: KCR/BH#26
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R303465	Geologist: Efaz Danish	Date Started: May-05-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: 20.40		Driller: Quaim	Date Completed: May-14-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00	CPT-1	1.0		Brown, highly fractured, very poor, hard, Sandy SHALE, with embedded Gravels	50/10cm				R	o							
11.00	CRS-11										10.00	11.00	75	18	-	-	
	SPT-9	2.9		Brown, highly fractured to fractured, very poor, medium to coarse grained, medium hard, SANDSTONE	50/15				R	o							
12.00	CRS-12										11.00	12.00	78	12	-	-	
	SPT-10				17	30/5cm			R	o							
13.00	CRS-13										12.00	13.00	79	54	-	-	
	SPT-11				44	15/1cm			R	o							
14.00	CRS-14	3.1		Brown, highly fractured, poor, medium hard, Sandy SHALE, with embedded Gravels (interbed Silty SANDSTONE b/w 14 -15m)							13.00	14.00	70	36	13.63	13.75	Sample wax 12cm
15.00	CRS-15										14.00	15.00	60	Nil	-	-	
16.00	CRS-16										15.00	16.00	78	10	-	-	
17.00	CRS-17	1.1		Brown, highly fractured, poor, closely jointed, medium hard, Sandy LIMESTONE							16.00	17.00	75	36	16.06	16.20	Sample wax 14cm
18.00	CRS-18										17.00	18.00	78	23	17.07	17.20	Sample wax 13cm
19.00	CRS-19	1.9		Light brown, highly fractured, very poor, closely jointed, very hard, CONGLOMERATE							18.00	19.00	72	Nil	-	-	
20.00	CRS-20	0.1		Brown, highly fractured, very poor, medium hard, SHALE							19.00	20.00	86	11	-	-	
				END OF BOREHOLE AT 20.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate: N: 2757257	Ground Water: 9.50m	Borehole No: KCR/BH#27
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian	E: 42R302952	Geologist: Wajid	Date Started: May-15-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +21.90	Driller: Rauf	Date Completed: May-18-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	65						CORE RUN						Remarks
					15 (cm)	10 (cm)	10 (cm)	10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	Depth (m) From	Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	
0.00		0.5		Black Asphaltic Stone, with filled material.													
1.00	CRS-1	1.2		Brown, medium dense, Sandy Clayey SILT, trace to little Gravels							0.00	1.00	80	NA	-	-	Dry Coring
	SPT-1				6	4	4	4	12								
2.00	CRS-2	5.3		Brown, dense to very dense, fine to coarse, Clayey Silty SAND, trace to little Gravels.							1.00	2.00	90	NA	-	-	Dry Coring
	SPT-2				16	12	9	12	33								
3.00	CRS-3										2.00	3.00	80	NA	-	-	
	SPT-3				37	27	27	29	83								
4.00	CRS-4										3.00	4.00	75	NA	-	-	
	SPT-4				36	18	23	19	60								
5.00	CRS-5										4.00	5.00	75	NA	-	-	
	SPT-5				40	22	22	24	68								
6.00	CRS-6										5.00	6.00	80	NA	-	-	
	SPT-6				50	40	10/5cm		R								
7.00	CRS-7										6.00	7.00	80	NA	-	-	
	SPT-7	1.0		Dark brown, hard, Sandy CLAY, little Gravels.	8	8	9	14	31								
8.00	CRS-8										7.00	8.00	80	NA	-	-	
9.00	CRS-9	1.0		Dark Brown, Sandy Clayey SILT, trace Gravels.							8.00	9.00	76	NA	8.71	8.82	Sample Waxed 11cm
	SPT-8	1.0		Brown, very dense, fine to coarse, Clayey Silty SAND.	36	32/10cm			R								
10.00	CRS-10										9.00	10.00	82	NA	-	-	

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2757257	Ground Water: 9.50m	Borehole No: KCR/BH#27
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R302952	Geologist: Wajid	Date Started: May-15-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +21.90		Driller: Rauf	Date Completed: May-18-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00	SPT-9	1.0		Brown, very dense, fine to coarse, Gravely SAND, trace Clay & Silt at places	25/3				R	o							
11.00	CRS-11										10.00	11.00	60	NA	-	-	
	SPT-10	2.5		Brown, very hard, Sandy Clayey SILT, trace Gravels.	30/4cm				R	o							
12.00	CRS-12										11.00	12.00	80	NA	11.61	11.72	Sample Waxed 11cm
	SPT-11				21	25	30/5cm		R	o							
13.00	CRS-13										12.00	13.00	80	NA	-	-	
	SPT-12				20/3cm				R	o							
14.00	CRS-14	1.5		Brown, highly fractured, very poor, medium to coarse grained, medium hard, SANDSTONE, with little Gravels and lenses of SHALE.							13.00	14.00	75	21	13.18	13.28	Sample Waxed 10cm
	SPT-13				15/4cm				R	o							
15.00	CRS-15										14.00	15.00	60	13	-	-	
16.00	CRS-16	5.0		Yellowish brown, highly fractured, very poor, loosly cemented, CONGLOMERATE, with CLAY as matrix, and lenses of SHALE at places							15.00	16.00	60	Nil	-	-	
17.00	CRS-17										16.00	17.00	42	10	-	-	
18.00	CRS-18										17.00	18.00	70	23	-	-	
19.00	CRS-19										18.00	19.00	65	Nil	-	-	
20.00	CRS-20										19.00	20.00	65	Nil	-	-	
				END OF BOREHOLE AT 20.0m Depth													

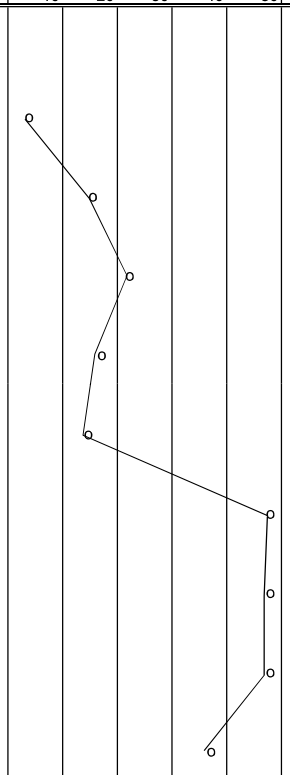
SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2757518	Ground Water: 1.60m	Borehole No: KCR/BH#28
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R302412	Geologist: Wajid	Date Started: May-19-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +21.43		Driller: Rauf	Date Completed: May-22-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
0.00 – 1.00	CRS-1	1.0		Brownish, silty fine to coarse, SAND, little Gravels, trace Garbage, (as filled material)						0.00	1.00	99	NA	-	-	Dry Coring
1.00 – 2.00	SPT-1, CRS-2	2.0		Brown, loose to medium dense, fine to medium, Clayey Silty SAND, with some Concretion	2	1	2	1	4	1.00	2.00	98	NA	-	-	Dry Cornig
2.00 – 3.00	SPT-2, CRS-3				5	4	5	7	16	2.00	3.00	90	NA	-	-	
3.00 – 4.00	SPT-3, CRS-4	2.0		Brown, medium dense, Sandy Clayey SILT, trace Gravels, trace concretion.	7	6	7	9	22	3.00	4.00	99	NA	3.18	3.3	Sample Waxed 12cm
4.00 – 5.00	SPT-4, CRS-5				7	7	5	6	18	4.00	5.00	85	NA	-	-	
5.00 – 6.00	SPT-5, CRS-6	1.0		Yellowish Brown, medium dense, Silty SAND, trace Gravels, some concretion	5	5	5	5	15	5.00	6.00	80	NA	-	-	
6.00 – 7.00	SPT-6, CRS-7	1.0		Brown, dense, fine to coarse, Silty SAND, little Gravels	20	15	16	18	49	6.00	7.00	85	NA	-	-	
7.00 – 8.00	SPT-7, CRS-8	2.8		Brown, very hard to hard, Sandy CLAY	14	12	19	18	49	7.00	8.00	98	NA	-	-	
8.00 – 9.00	SPT-8, CRS-9				18	17	18	23	58	8.00	9.00	95	NA	8.75	8.88	Sample Waxed 13cm
9.00 – 10.00	SPT-9, CRS-10	0.2		Brown, dense, medium to coarse, Clayey SAND	10	10	13	15	38	9.00	10.00	90	NA	9.36	9.48	Sample Waxed 12cm

Graph N/30 cm



SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Client: The JICA Study Team	Type of Boring: Rotary	Co-ordinate:	N: 2757518	Ground Water: 1.60m	Borehole No: KCR/BH#28
Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi	Machine Make: Russian		E: 42R302412	Geologist: Wajid	Date Started: May-19-2012
Contractor:Consolidated Engineering Services (Pvt) Ltd	Drilling Fluid: Bentonite	Ground Elevation: +21.43		Driller: Rauf	Date Completed: May-22-2012

Depth (m)	Sample No.	Thickness of Layer (m)	Lithology	Stratum Description	SPT 15 (cm)	SPT 10 (cm)	SPT 10 (cm)	SPT 10 (cm)	N Blows 30cm	Graph N/30 cm (10 20 30 40 50)	CORE RUN Depth (m) From	CORE RUN Depth (m) To	Core Recovery (Cm)	R.Q.D (%)	Core Waxed for Testing (m) From	Core Waxed for Testing (m) to	Remarks
10.00	SPT-10	2.6		Brown, very dense, Clayey Silty SAND, little to some Gravels	36	27	22	33	82								
11.00	CRS-11										10.00	11.00	80	NA	-	-	
	SPT-11				50/9cm				R								
12.00	CRS-12										11.00	12.00	80	NA	11.82	11.94	Sample Waxed 12cm
	SPT-12				30/7cm				R								
13.00	CRS-13	2.0		Brown, moderately fractured, fair, medium to coarse grained, friable SANDSTONE							12.00	13.00	70	46	12.76	12.88	Sample Waxed 12cm
	SPT-13				23/5cm				R								
14.00	CRS-14										13.00	14.00	70	38	-	-	
	CPT-1				10/2cm				R								
15.00	CRS-15	0.8		Yellowish brown, moderately fractured, fair, loosely cemented, CONGLOMERATE							14.00	15.00	65	60	-	-	
	CPT-2				50/4cm				R								
16.00	CRS-16	2.1		Brown, moderately fractured, fair, medium to coarse grained, friable SANDSTONE							15.00	16.00	65	Nil	-	-	
17.00	CRS-17										16.00	17.00	80	35	16.60	16.75	Sample Waxed 15cm
18.00	CRS-18	2.5		Brown, highly fractured, very poor, medium hard, CONGLOMERATE, with lenses of Clayey SANDSTONE at a places							17.00	18.00	80	22	-	-	
19.00	CRS-19										18.00	19.00	70	10	-	-	
20.00	CRS-20										19.00	20.00	80	10	-	-	
				END OF BOREHOLE AT 20.0m Depth													

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length